Mesonet
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connection
Volume 4 — Issue 5 — May 2013

Oklahoma Mesonet Honored

–by Stephanie Bowen

"THERE WAS THE SHOPPING CART and the parking meter, of course. But Oklahomans have demonstrated a knack for innovation that has given us such diverse products as the yield sign, the pressurized flight suit, the compact trencher known as the Ditch Witch, and crystalline polypropylene."

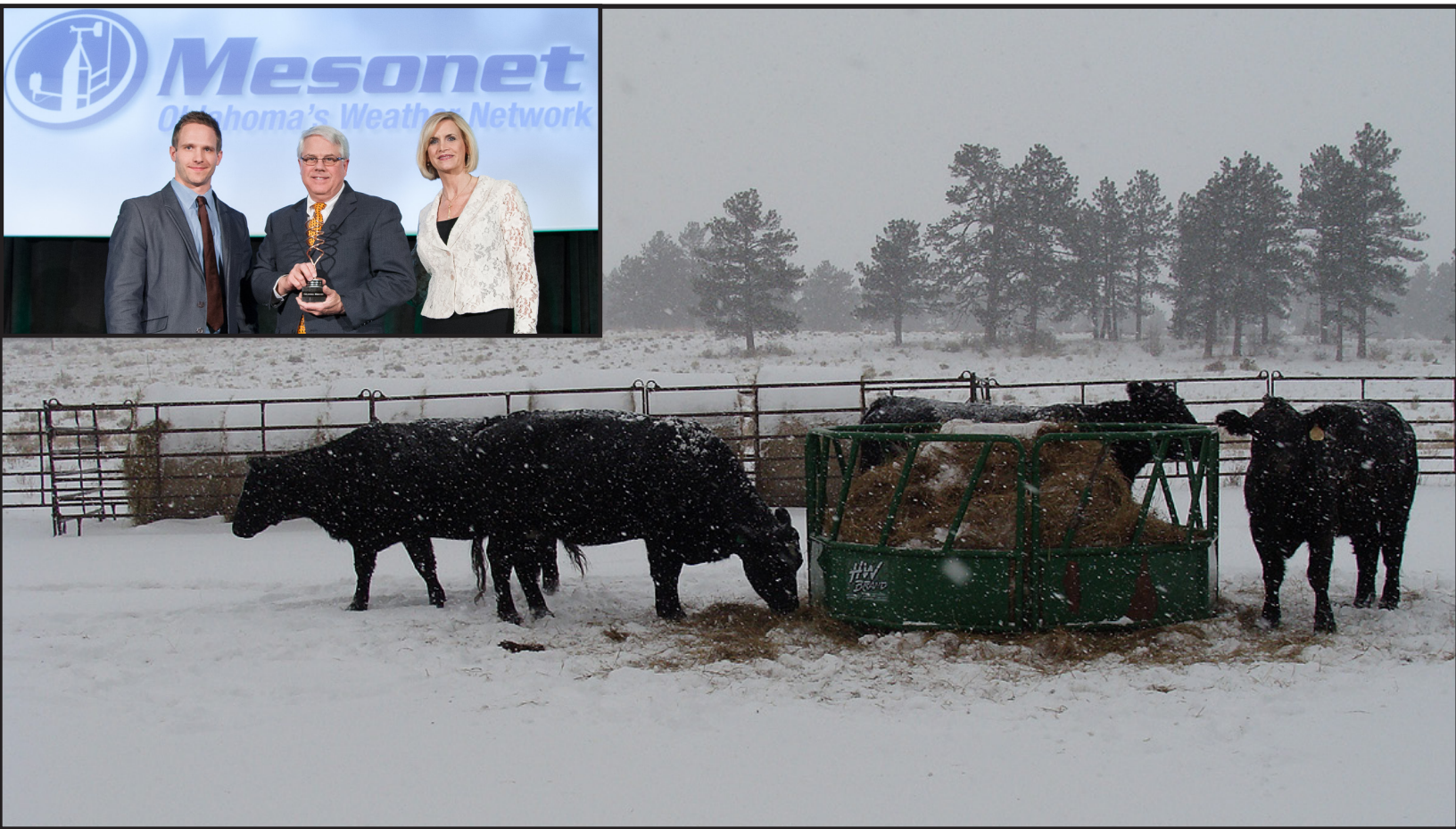
The Journal Record's Innovator of the Year program introduction set the tone for an evening of celebration last month. They recognize Oklahomans each spring who design innovative products and services. The Mesonet was recognized this year for their Cattle Comfort Advisor, designed by Mesonet staff along with OSU experts Chris Richards, David Lalman, Bob LeValley and Greg Highfill.

Oklahoma's extreme weather can have a dramatic impact on livestock. Extreme conditions can alter feed intake, reduce daily weight gain, and impact animal health. The cattle comfort maps, provided in the Mesonet Agriculture section, are designed to help producers identify current and future periods of stress. The maps indicate two levels of heat stress, two levels of cold stress and a range of no stress.

"Knowing which weather variables have the most impact helps farmers and ranchers determine how new infrastructure dollars should be spent to have the most impact on cattle health and gain," said Al Sutherland, Oklahoma Mesonet's Agricultural Coordinator.

The Cattle Comfort Advisor includes a variety of display products to provide information for ranchers and cattle industry professionals, including: current and yesterday maps, forecast high and low maps, 10-day and 3-day forecast graph and table, 45-day graph and table, and high and low current and last year graph. To find out more, visit the Learn More tab of the Mesonet's Agriculture section. ■

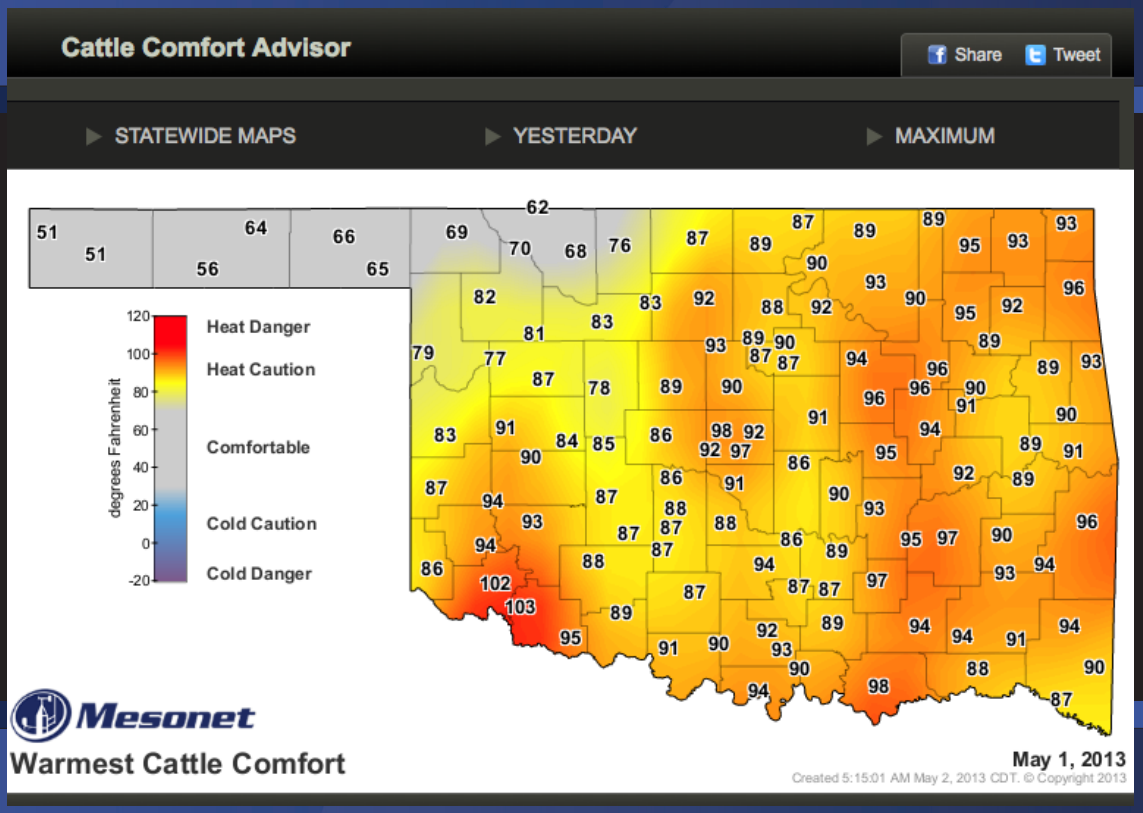
The Mesonet collaborated with OSU animal scientists to create the Cattle Comfort Advisor. The model indicates heat and cold stress on cattle using weather variables. Inset: Albert Sutherland accepting the Innovator of the Year award on behalf of the Mesonet from Kenneth Knoll (left), Director of Advisory Services for i2E, and Mary Mélon, President and Publisher of The Journal Record. Photo courtesy of The Journal Record.



MESONET IN PICTURES

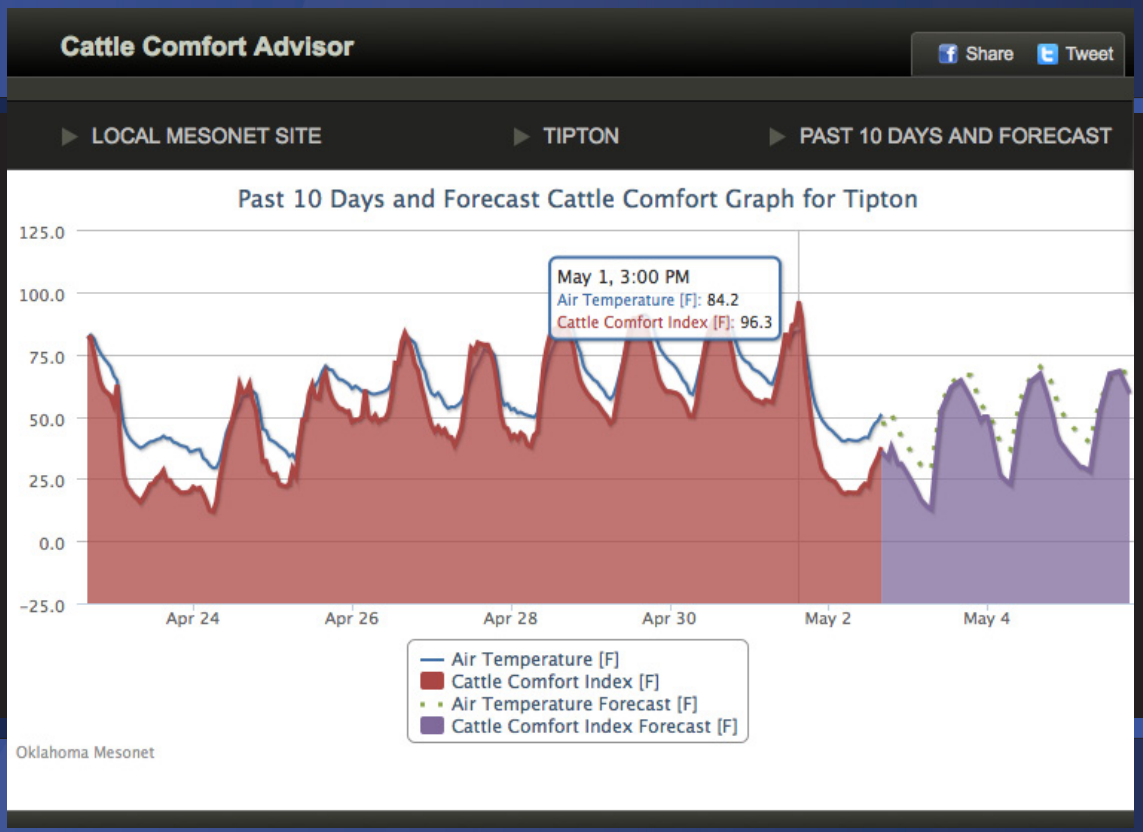
Cattle Comfort Statewide Maps

- The map shows Cattle Comfort index highs for May 1. As you can see, Altus and Tipton had index highs of 102 and 103 for that day. The Mesonet Maximum Air Temperature was 86 degrees for both sites that day. Statewide Cattle Comfort maps can be viewed by going to mesonet.org, clicking on Agriculture in the top menu, and then selecting Cattle Comfort in the left menu under Agriculture Essentials.



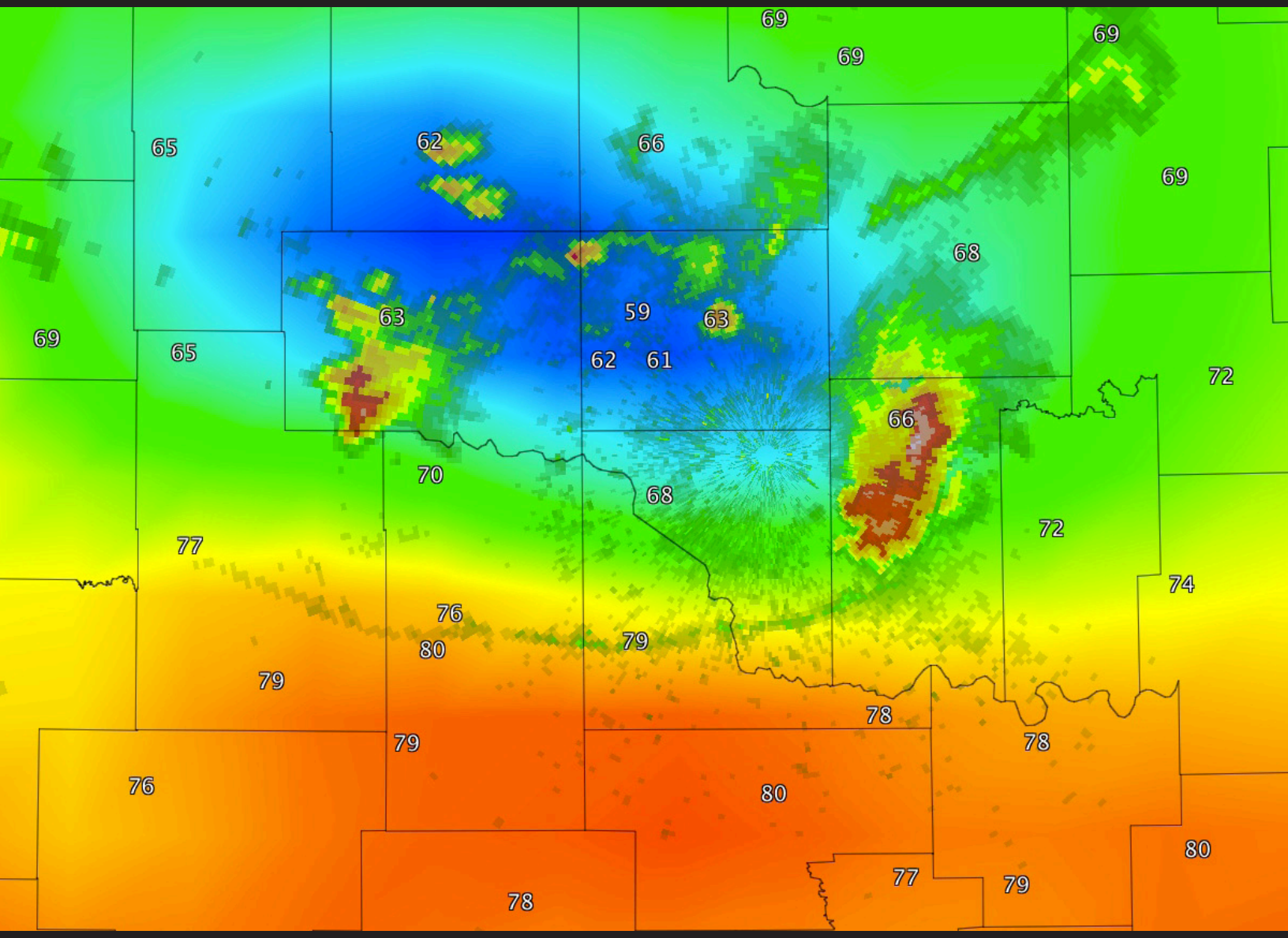
Past 10 Days and Forecast Cattle Comfort Graph

- The graph shows cattle comfort values and air temperatures. The red color, filled series shows past cattle comfort index values in one-hour increments. The blue, solid line shows past Mesonet air temperatures. The purple, filled graph area shows the forecast cattle comfort index. The gray-green, dotted line is the forecast air temperature. Notice the high cattle comfort index values on May 1 and the forecasted lows on May 3 after the cold front. Visit the Mesonet Agriculture section to view these graphs.



Radar depicting Gust Front

- The radar image depicts a gust front (green “trail” at bottom) after a storm on May 16, 2010 at 5:10 pm. The temperatures on here are in Fahrenheit and from the Mesonet. As you can see, the air ahead of the front is warm, while the air behind it is colder. The researchers at the National Severe Storms Laboratory have studied Mesonet data to determine how cold the air is behind thunderstorm gust fronts llike this one.



Steering Committee Member Q&A: David Stensrud

–by Stephanie Bowen

Q: TELL ME A LITTLE ABOUT YOUR BACKGROUND AND HOW YOU BECAME INVOLVED WITH THE MESONET ON THE STEERING COMMITTEE.

A: I have been a Research Meteorologist at the NOAA National Severe Storms Laboratory (NSSL) for over 25 years, with a strong interest in the use of computer models to improve severe weather forecasting. My degrees are in meteorology from the University of Wisconsin-Madison (BA) and The Pennsylvania State University (MS, PhD). I have been a fan of the Mesonet ever since its creation and have used Mesonet data in a number of my research studies, and thus was delighted to be asked to be a Steering Committee member in 2000. A scientist from NSSL has been a member of the Steering Committee since its inception as one of the three members from the University of Oklahoma.

Q: HOW DOES YOUR WORK AT THE NSSL IMPACT YOUR ROLE AS A LEADER OF THE MESONET?

A: I hope that my experiences at NSSL have been helpful to the Mesonet. Being a meteorologist, I appreciate the many uses of Mesonet data in research and operational forecasting and value its high quality and added value products. Being a division and project manager at NSSL, I have grown to appreciate the importance of management structure to organizational success. Being involved in the broader meteorology community, I recognize the value of partnerships and regard the Mesonet's OSU-OU partnership with the greatest admiration. I try to bring my knowledge and experience to Steering Committee meetings with the goal of helping the Mesonet maintain its international reputation as the gold standard for mesonetworks and grow in the many ways it supports the citizens of Oklahoma.

Q: HOW DOES THE MESONET IMPACT THE RESEARCH BEING CONDUCTED AT NSSL?

A: Mesonet data is used by NSSL in the development and real-time testing of new severe weather warning and forecast systems. The high quality of Mesonet data makes it very easy to use, since the quality assurance is so well done by Mesonet staff. The goal of our research is to improve warnings and forecasts for severe weather events, such as tornadoes, hail storms, and damaging winds.

One memorable project that used Mesonet data was to determine how cold the air is behind thunderstorm gust fronts. A gust front is simply the boundary between the warm air ahead of the storm and the cold air behind it. We've known about the cold air behind gust fronts for over 50 years, but no one had looked at lots of these events to find out the range of conditions behind gust fronts. The big problem with older non-Mesonet data sets is that the observations were only available once an hour, which is not enough to capture the fine structure of gust fronts. However, with the Mesonet we have data every 5 minutes! So we examined over 1300 sequences of 3-6 hours worth of Mesonet data from individual stations during thunderstorm events and now have a much improved understanding of how cold the air can be behind a gust front. The largest temperature decrease we found was over 30 degrees Fahrenheit! This value is much larger than previously reported in the science literature, illustrating the value of Mesonet data to science. ■

Drought Relief Accompanies Cold Weather During April

By Gary McManus, Associate State Climatologist

APRIL WRAP-UP

Just how cold was April 2013 in Oklahoma? According to preliminary data from the Mesonet, the statewide average temperature came in at 55 degrees to rank as the seventh coolest April on record, 4.1 degrees below normal. Records of that type began in 1895. That sounds fairly cold, but becomes downright frigid considering the state's recent climate history. It could be measured against last year's April, the eighth warmest on record, which finished with a statewide average temperature of 64.1 degrees. Better yet, it could be measured against last March's record warm mark of 59.6 degrees. Regardless of statistics, the evidence speaks for itself, such as the record late freezes in many locations, or the snow and ice that accumulated on tree branches where buds should have appeared. The frosty weather was a continuation of cooler than normal conditions that began in mid-February and persisted through March. The March-April statewide average temperature was 51.1 degrees, 3.5 degrees below normal to rank the first two months of spring as the 12th coolest on record. April became the third month in a row that saw the state finish with below normal temperatures, a feat not accomplished since the winter months of 2011-12. Prior to this February, 28 of the previous 34 months in Oklahoma were warmer than normal.

55°F
average statewide temperature for April

7th COLDEST
April since record began in 1895

The drought relief that began in February also gained momentum during April. According to Mesonet rain gauges across the state, the average precipitation total came in at exactly 4 inches for the month, about 0.6 inches above normal. That would rank the month as the 37th wettest April since records began in 1895. Not all areas of the state saw equally beneficial rains, however. The panhandle saw a half-inch of precipitation on average to rank April as the ninth driest on record for that area. The most significant rains fell from Kiowa County in the southwest through Pottawatomie County in central Oklahoma. Totals along that path ranged from 8 to 11 inches. Chickasha led all Mesonet stations with 10.6 inches. The latest U.S. Drought Monitor report reflected those recent rains with more than 25 percent of the state out of drought, mostly across eastern and central Oklahoma. Areas across western, southern and northern Oklahoma were depicted in more significant intensities of drought, with 54 percent of the state still categorized in at least severe drought.

4.00" PRECIPITATION
statewide average for April

April was an active severe weather month. Although the count is still preliminary, at least a dozen twisters struck the state during April. The most significant tornado, rated EF2 on the Enhanced Fujita scale, struck Delaware County early on the 18th, destroying a home and damaging others. The preliminary tornado count for the year rose to 16, close to the average number for January-April. The severe weather came in frozen form, too. An unusually thick layer of ice coated western and northern Oklahoma on April 10 and caused widespread power outages and traffic accidents. That severe winter blast arrived on the heels of temperatures in the 80s the day before. Another wintry blast on April 23 coated power lines in the Panhandle with more than a half-inch of ice to cause power disruptions in that area. Each of those cold air outbreaks dropped temperatures below freezing for a significant period of time, long enough to do damage to wheat and other crops already stressed from prolonged drought. The final assessment on the scope of the freeze damage might not occur until harvest time in late spring.

10.6" RAINFALL
Recorded at the Mesonet site at Chickasha for April

CALENDAR

MAY

- 1st: Fieldtrip for Westfall Elementary, Choctaw
- 2nd: School Visit to Centennial Middle School, Broken Arrow
- 7th: Field Trip for Prague Elementary
- 8th: Mesonet Steering Committee Meeting, Norman
- 9th: Field Trip for Sequoyah Middle School, Edmond
- 23rd: Oklahoma Water Quantity Group Meeting, OKC

JUNE

- 3rd: Logan County 4-H National Weather Center Tour, Norman
- 3rd: Challenges in Horticulture presentation, Stillwater
- 9th-14th: Oklahoma Mesonet Weather Camp for Middle School (Deadline has passed to apply)
- 14th: OK State Master Gardener Conference, El Reno
- 14th: Tour for NASA Mission to Planet Earth Teacher Workshop
- 27th-29th: OK Pecan Growers Assoc Annual Mtg, Ardmore

Thank you for 20 years of partnership!

- Retrop - Installed May 5, 1993
- Butler - Installed May 10, 1993

CONTACTS

Accessing recent (within the past 7 days) Mesonet data
Contact: Mesonet Operator

Instrumentation, telecommunications, or other technical specifications
Contact: Chris Fiebrich

Mesonet agricultural data and products
Contact: Al Sutherland

Mesonet meteorological data
Contact: OCS Data Requests

Earthstorm - K-12 educational outreach
Contact: Andrea Melvin

OK-First - Public safety outreach
Contact: James Hocker

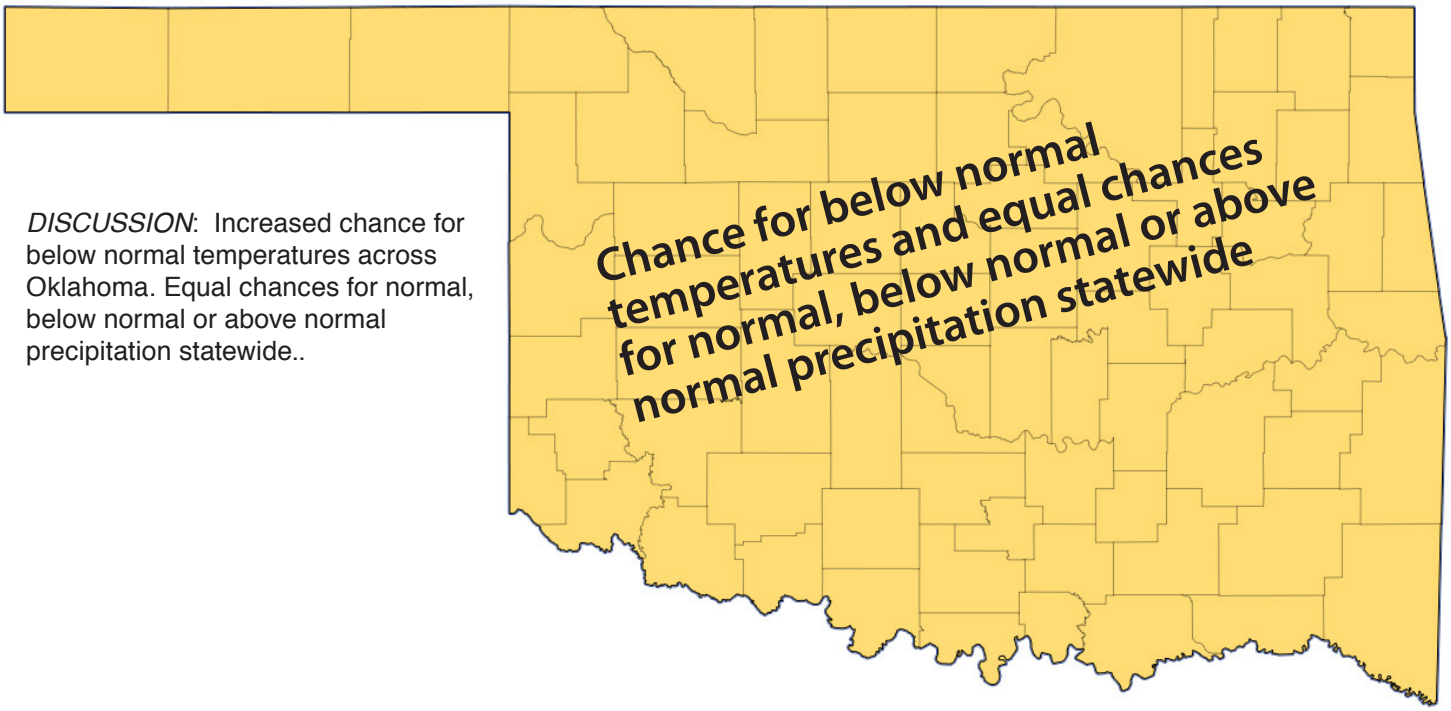
OK-FIRE - Fire management outreach
Contact: J.D. Carlson

Not sure?
Contact: 405-325-2541 or Chris Fiebrich.

FORECAST FOR MAY

Click here to view the original maps from the Climate Prediction Center.

DISCUSSION: Increased chance for below normal temperatures across Oklahoma. Equal chances for normal, below normal or above normal precipitation statewide..



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